

R E M A R K S

An Office Action was mailed on September 23, 2004. Claims 1 - 6 are pending in the present application. With this response, Applicant amends claims 1, 3, 4 and 5. No new matter is introduced. Support for the amendments may be found, for example, by reference to FIGs. 7A, 7B and 8, and page 7, line 24 – page 9, line 4 of Applicants' specification.

REJECTION UNDER 35 U.S.C. § 103

Claims 1 and 2 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No 5,751,172 to Takano in view of U.S. Patent No. 5,159,543 to Yamawaki. Claims 3 and 4 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Takano in view of U.S. Patent No. 6,377,818 to Irube et al. Claims 5 and 6 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Takano in view of Yamawaki and Irube. Applicants amend claims 1, 3, 4 and 5 to clarify the nature of their invention, and respectfully traverse these rejections.

In amended independent claim 1, Applicant discloses:

1. A portable terminal equipped with a display unit, the portable terminal comprising:

a DC/DC converter for supplying power to the display unit;

a frequency switching unit for selectively switching and supplying one of a plurality of switching clock frequencies to the DC/DC converter; and

a display mode detecting unit for detecting that the display unit has been switched to a predetermined low-power consumption mode, determining one of the plurality of switching clock frequencies to maintain an efficiency of the DC/DC converter at an optimum level in the predetermined low-power consumption mode, and instructing the frequency switching unit to execute this selective switching.

(Emphasis added)

Takano discloses an apparatus for switching the frequency of a clock supplied to a computer (see, e.g., abstract of Takano). In FIG. 2, Takano discloses a DC/DC converter 210 that provides power to a display 209 (see, e.g., column 3, lines 23 – 26 of Takano). While Takano teaches supplying a plurality of switched clock frequencies, the Examiner acknowledges that Takano fails to teach supplying one of these switched frequencies to DC/DC converter 210. The Examiner suggests, however, that this limitation is taught by Yamawaki (see, e.g., column 2, lines 20 – 31 of Yamawaki). The Examiner also suggests that Takano teaches monitoring a display to determine whether the display has been halted (citing column 5, lines 54 – 59 and column 6, lines 12 – 20 of Takano).

At column 4, line 23 – 48, Takano indicates a stage of operation in which the CPU is halted after the DC/DC converter is turned off. Unlike Applicants' claimed invention, Takano however makes no reference to monitoring a condition of the display for the purpose of switching a clock frequency. Moreover, unlike Applicants' claimed invention, Takano fails to teach or suggest Applicants' display mode detecting unit that selects one of the switching frequencies in order to maintain an efficiency of the DC/DC converter when entering a predetermined low-power consumption mode.

Yamawaki teaches a switched capacitor type of DC/DC converter supplied by one of two switching clocks. A higher-speed clock is used at start-up to rapidly turn up the power supply from a power off state to a power on state, and a lower-speed clock is then used to maintain power during the power on state. However, unlike Applicants' claimed invention, Yamawaki fails to teach or suggest determining a switching clock frequency of the DC/DC converter on the basis of maintaining a DC/DC converter efficiency in a low-power consumption mode. Rather, after start-up, Yamawaki teaches only a unitary power consumption mode.

As a result, Applicants respectfully submit that amended independent claim 1 is not made obvious by the combination of Takano and Yamawaki, and is therefore allowable. Applicants apply essentially the same arguments with respect to amended independent claims 4 and 5, which include like limitations for determining a clock frequency of the DC/DC converter. On this basis, Applicants respectfully submit that amended independent claims 4 and 5 are not made obvious by the combination of Takano and Yamawaki, and are therefore allowable.

Amended independent claim 3 recites a method a switching for switching a clock frequency of the DC/DC converter in response to reducing a number of display colors. The Examiner suggests that Irube teaches a display color limiting mode (see, e.g., column 15, lines 38 – 51 of Irube). However, the cited passage in Irube makes reference only to the operation of a partial display, and makes no reference to changing clock frequency based on limiting a number of display colors. On this basis, Applicants respectfully submit that amended independent claim 3 is not made obvious by the combination of Irube with Takano and Yamawaki, and is therefore allowable.

As dependent claims 2 and 6 depend from allowable claim 1, Applicants further submit that dependent claims 2 and 6 are allowable for at least this reason.

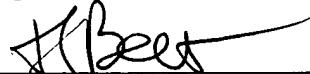
CONCLUSION

An earnest effort has been made to be fully responsive to the Examiner's objections. In view of the above amendments and remarks, it is believed that claims 1 – 6, consisting of independent claims 1 and 3 – 5, and the claims dependent therefrom, are in condition for allowance. Passage of this case to allowance is earnestly solicited. However, if for any reason the Examiner should consider this application not to be in condition for allowance, he or she is

respectfully requested to telephone the undersigned attorney at the number listed below prior to issuing a further Action.

Any fee due with this paper may be charged on Deposit Account 50-1290.

Respectfully submitted,



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